osteoporosis-pseudoglioma syndrome

Osteoporosis-pseudoglioma syndrome is a rare condition characterized by severe thinning of the bones (osteoporosis) and eye abnormalities that lead to vision loss. In people with this condition, osteoporosis is usually recognized in early childhood. It is caused by a shortage of minerals, such as calcium, in bones (decreased bone mineral density), which makes the bones brittle and prone to fracture. Affected individuals often have multiple bone fractures, including in the bones that form the spine (vertebrae). Multiple fractures can cause collapse of the affected vertebrae (compressed vertebrae), abnormal side-to-side curvature of the spine (scoliosis), short stature, and limb deformities. Decreased bone mineral density can also cause softening or thinning of the skull (craniotabes).

Most affected individuals have impaired vision at birth or by early infancy and are blind by young adulthood. Vision problems are usually caused by one of several eye conditions, grouped together as pseudoglioma, that affect the light-sensitive tissue at the back of the eye (the retina), although other eye conditions have been identified in affected individuals. Pseudogliomas are so named because, on examination, the conditions resemble an eye tumor known as a retinal glioma.

Rarely, people with osteoporosis-pseudoglioma syndrome have additional signs or symptoms such as mild intellectual disability, weak muscle tone (hypotonia), abnormally flexible joints, or seizures.

Frequency

Osteoporosis-pseudoglioma syndrome is a rare disorder that occurs in approximately 1 in 2 million people.

Genetic Changes

Osteoporosis-pseudoglioma syndrome is caused by mutations in the *LRP5* gene. This gene provides instructions for making a protein that participates in a chemical signaling pathway that affects the way cells and tissues develop. In particular, the LRP5 protein helps regulate bone mineral density and plays a critical role in development of the retina.

LRP5 gene mutations that cause osteoporosis-pseudoglioma syndrome prevent cells from making any LRP5 protein or lead to a protein that cannot function. Loss of this protein's function disrupts the chemical signaling pathways that are needed for the formation of bone and for normal retinal development, leading to the bone and eye abnormalities characteristic of osteoporosis-pseudoglioma syndrome.

Inheritance Pattern

Osteoporosis-pseudoglioma syndrome is inherited in an autosomal recessive pattern, which means both copies of the *LRP5* gene in each cell have mutations. The parents of an individual with an autosomal recessive condition each carry one copy of the mutated gene, but they typically do not show signs and symptoms of the condition. However, some carriers may have decreased bone mineral density.

Other Names for This Condition

- OPPG
- osteogenesis imperfecta, ocular form

Diagnosis & Management

Genetic Testing

- Genetic Testing Registry: Osteoporosis with pseudoglioma
  https://www.ncbi.nlm.nih.gov/gtr/conditions/C0432252/

Other Diagnosis and Management Resources

- Lucile Packard Children's Hospital at Stanford: Juvenile Osteoporosis
  http://www.stanfordchildrens.org/en/topic/default?id=juvenile-osteoporosis-90-P01965
- MedlinePlus Encyclopedia: Bone Mineral Density Test
  https://medlineplus.gov/ency/article/007197.htm
- Merck Manual Home Health Edition: Osteoporosis
  http://www.merckmanuals.com/home/bone-joint-and-muscle-disorders/osteoporosis/osteoporosis

General Information from MedlinePlus

- Diagnostic Tests
  https://medlineplus.gov/diagnostictests.html
- Drug Therapy
  https://medlineplus.gov/drugtherapy.html
- Genetic Counseling
  https://medlineplus.gov/geneticcounseling.html
- Palliative Care
  https://medlineplus.gov/palliativecare.html
- Surgery and Rehabilitation
  https://medlineplus.gov/surgeryandrehabilitation.html

Additional Information & Resources

MedlinePlus

- Encyclopedia: Bone Mineral Density Test
  https://medlineplus.gov/ency/article/007197.htm
- Health Topic: Bone Density
  https://medlineplus.gov/bonedensity.html
- Health Topic: Bone Diseases
  https://medlineplus.gov/bonediseases.html
- Health Topic: Osteoporosis
  https://medlineplus.gov/osteoporosis.html
- Health Topic: Vision Impairment and Blindness
  https://medlineplus.gov/visionimpairmentandblindness.html

Genetic and Rare Diseases Information Center

- Osteoporosis-pseudoglioma syndrome
  https://rarediseases.info.nih.gov/diseases/4160/osteoporosis-pseudoglioma-syndrome

Additional NIH Resources

- National Institute of Arthritis and Muskuloskeletal and Skin Diseases: Juvenile Osteoporosis
  https://www.niams.nih.gov/Health_Info/Bone/Bone_Health/Juvenile/juvenile_osteoporosis.asp

Educational Resources

- Boston Children's Hospital Center for the Study of Genetic Skeletal Disorders
  http://www.childrenshospital.org/research-and-innovation/research/centers/center-for-the-study-of-genetic-skeletal-disorders
- Disease InfoSearch: Osteoporosis-pseudoglioma syndrome
  http://www.diseaseinfosearch.org/Osteoporosis-pseudoglioma+syndrome/5488
- KidsHealth from Nemours: Osteoporosis
  http://kidshealth.org/en/kids/osteoporosis.html
- Lucile Packard Children's Hospital at Stanford: Juvenile Osteoporosis
  http://www.stanfordchildrens.org/en/topic/default?id=juvenile-osteoporosis-90-P01965
- MalaCards: osteoporosis-pseudoglioma syndrome
  http://www.malacards.org/card/osteoporosis_pseudoglioma_syndrome

- Merck Manual Home Health Edition: Osteoporosis
  http://www.merckmanuals.com/home/bone-joint-and-muscle-disorders/osteoporosis/osteoporosis
- National Osteoporosis Foundation: What is Osteoporosis and What Causes It?
  https://www.nof.org/patients/what-is-osteoporosis/
- Orphanet: Osteoporosis-pseudoglioma syndrome
  http://www.orpha.net/consor/cgi-bin/OC_Exp.php?Lng=EN&Expert=2788
- University of Arizona
  http://disorders.eyes.arizona.edu/disorders/osteoporosis-pseudoglioma-syndrome

Patient Support and Advocacy Resources

- American Foundation for the Blind
  http://www.afb.org/default.aspx
- National Osteoporosis Foundation
  https://www.nof.org/
- The Foundation Fighting Blindness
  http://ffb.ca/

ClinicalTrials.gov

- ClinicalTrials.gov
  https://clinicaltrials.gov/ct2/results?cond=%22osteoporosis-pseudoglioma+syndrome%22+OR+%22juvenile+osteoporosis%22

Scientific Articles on PubMed

- PubMed
  https://www.ncbi.nlm.nih.gov/pubmed?term=%28osteoporosis-pseudoglioma+syndrome%5BTIAB%5D%29+AND+english%5Bla%5D+AND+human%5Bmh%5D+AND+%22last+2520+days%22%5Bdp%5D

OMIM

- OSTEOPOROSIS-PSEUDOGLIOMA SYNDROME
  http://omim.org/entry/259770

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